AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
J	1 | 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
0001	07-Jun-2002	W807PM-2099-7798	

6. ISSUED BY CODE DACW38
VBURG CONSOL CONTRACTING OFC
4155 CLAY ST
VICKSBURG MS 39183-3435

7. ADMINISTERED BY (If other than item 6) CODE
See Item 6

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)

CODE FACILITY CODE

X	9A. AMENDMENT OF SOLICITATION NO. DACW38-02-B-0025
X	9B. DATED (SEE ITEM 11) 13-May-2002
	10A. MOD. OF CONTRACT/ORDER NO.
	10B. DATED (SEE ITEM 13)

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

[X] The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer [X] is extended, [ ] is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods:
(a) By completing Items 8 and 15, and returning 1
or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS.
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

[ ] A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

[ ] B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).

[ ] C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

[ ] D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor [ ] is not, [ ] is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

Reference Invitation for Bids No. DACW38-02-B-0025 for Flood Contorl, Mississippi River and Tributaries, Maintenance, Boeuf-Tensas Basin, Bayou LaFourche, Richland and Morehouse Parishes, LA, Irwin Lake Weir Rehabilitation scheduled for bids to open 13 June 2002 at 1400 hours is hereby amended as follows:

BID OPENING DATE

A new bid opening time and date of 1430 hours, 20 June 2002, is hereby established.

(See SF30 Continuation Page 2)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED 07-Jun-2002

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

BIDDING SCHEDULE

Page 3 of 142, BIDDING SCHEDULE, is replaced by revised page 3.

TECHNICAL SPECIFICATIONS

SECTIONS 01270, MEASUREMENT AND PAYMENT; 02213, ENGINEERING FABRIC; 02226, EXCAVATION, FILL AND BACKFILL; 02380, STONE PROTECTION FOR STRUCTURES; and 02775, CONTROL OF WATER, are deleted in their entireties and replaced by revised SECTIONS 01270, MEASUREMENT AND PAYMENT; 02213, ENGINEERING FABRIC; 02226, EXCAVATION, FILL AND BACKFILL; 02380, STONE PROTECTION FOR STRUCTURES; and 02775, CONTROL OF WATER.

DRAWINGS

All Drawings are reissued by this Amendment.

Pages revised by this Amendment have the notation “Revised by Amendment 0001” at the bottom of the pages.

ESTIMATED QUANTITIES

Estimated Quantities have been revised at http://www.mvk.usace.army.mil/contract.

FLOOD CONTROL, MISSISSIPPI RIVER AND TRIBUTARIES
MAINTENANCE, BOEUF-TENSAS BASIN
BAYOU LAFOURCHE, RICHLAND AND MOREHOUSE PARISHES
IRWIN LAKE WEIR REHABILITATION

BIDDING SCHEDULE

ITEM NO.	DESCRIPTION	EST QTY	U/M	UNIT PRICE	AMOUNT
0001	CLEARING AND GRUBBING	1	LS	FOR	$_____
0002	EROSION CONTROL	1	LS	FOR	$_____
0003	FILL AND BACKFILL	1	LS	FOR	$_____
*0004	ENGINEERING FABRIC	500	SY	$_____	$_____*
0005	FILTER STONE	18,600	TN	$_____	$_____
0006	R200 RIPRAP	6,610	TN	$_____	$_____
0007	R650 RIPRAP	59,500	TN	$_____	$_____
0008	EXCAVATION	1	LS	FOR	$_____
*0009	CONTROL OF WATER	1	LS	FOR	$_____*
				TOTAL	$_____

Lack of registration in the CCR database will make an offeror ineligible for award. SEE CONTRACT CLAUSE 252.204-7004 ENTITLED "REQUIRED CENTRAL CONTRACTOR REGISTRATION.

THE SF 1442, BIDDING SCHEDULE, AND SCTION 00600 (REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF BIDDERS) MUST BE ACCURATELY COMPLETED AND RETURNED WITH YOUR BID OR IT MAY BE REJECTED AS NONRESPONSIVE.

Revised by Amendment 0001

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01270

MEASUREMENT AND PAYMENT

-- End of Section Table of Contents --

SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 LUMP SUM PAYMENT ITEMS

1.1.1 General

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, submittal procedures, environmental protection, storm water pollution prevention, meeting safety requirements, tests and reports, providing as-built drawings (both blueline and electronic), and for performing all work required for which separate payment is not otherwise provided.

1.1.2 Lump Sum Items

a. "Clearing and Grubbing"

(1) Payment will be made for all costs associated with clearing and grubbing, which includes full compensation for performing all operations necessary for clearing and grubbing the areas specified herein or indicated on the drawings, removing and disposing of all cleared and grubbed materials, filling holes resulting from grubbing operations, Contractor-furnished off site disposal area(s), and all work incidental thereto.

(2) Unit of measure: lump sum.

b. "Erosion Control"

(1) Payment will be made for all costs associated with performing erosion control in accordance with Section 02960 EROSION CONTROL, including grading and dressing, fertilizing, disking or harrowing, seeding, compacting, mulching, and all work incidental thereto.

(2) Unit of measure: lump sum.

c. "Fill and Backfill"

(1) Payment will be made for all costs associated with constructing all required fill and backfill, including hauling, placing and compacting the material; performing all work for moisture control and density testing; and all work incidental thereto. All costs for excavating material for fill and backfill shall be included in the contract price for "Excavation".

(2) Unit of measure: lump sum.

d. "Excavation"

(1) Payment will be made for all costs associated with excavation, which includes full compensation for furnishing all plant, labor, materials and equipment, and performing the required excavation, including furnishing Contractor-furnished disposal area(s); disposing of excess suitable excavated material, unsuitable material and frozen materials; and all work incidental thereto.

(2) Unit of measure: lump sum.

e. "Control of Water"

(1) Payment will be made for all costs associated with performing control of water, including constructing ditches, dikes, cofferdams, collectors, drains, and sumps as may be required to collect and dispose the surface water within the work areas.

(2) Unit of measure: lump sum.

1.2 UNIT PRICE PAYMENT ITEMS

1.2.1 General

Payment items for the work of this contract on which unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, submittal procedures, environmental protection, storm water pollution prevention, meeting safety requirements, tests and reports, providing as-built drawings (both blueline and electronic), and for performing all work required for each of the unit price items.

1.2.2 Unit Price Items

a. "Engineering Fabric"

(1) Payment will be made for all costs associated with providing the engineering fabric, including performing all operations in connection with furnishing, installing, and maintaining the engineering fabric, and all work incidental thereto.

(2) Engineering fabric will be measured for payment by the nearest square yard in place and measurement will be made along the slope. Measurement and payment will not be made for material in laps and seams or engineering fabric replaced because of contamination or damage due to fault or negligence of the Contractor.

(3) Unit of measure: square yard.

b. "R200 Riprap", "R650 Riprap", and "Filter Stone"

(1) Payment will be made at the applicable contract unit price for all costs associated with furnishing scales and weighing for

measurement, and furnishing, transporting, stockpiling, placing, and constructing the filter stone and riprap as specified herein. Deductions will be made from the applicable payment for riprap if the riprap cannot be placed due to being contaminated with soil, dirt or refuse.

(2) Filter stone and riprap shall be measured for payment by the ton (2,000 pounds) by weighing each truckload to the nearest 0.1 ton, and the final quantity of the whole sum will be rounded to the nearest whole ton. The filter stone and riprap shall be measured for payment by being weighed by the Contractor on approved scales before being placed in the work. Quarry weights will not be accepted. Scales shall be of sufficient length to permit simultaneous weighing all axle loads and shall be inspected, tested and sealed as directed to assure accuracy with 0.5 percent throughout the range of the scales. The scales, located at the site of the work, shall be certified as to accuracy by an acceptable scales company representative prior to weighing any riprap. Scales will be checked and certified before filter stone and riprap hauling and rechecked and recertified whenever a variance is suspected. The Contractor shall furnish the scales. If commercial scales are readily available in close proximity (within 10 miles) of site of work, the Contracting Officer may approve the use of the scales. The riprap shall be weighed in the presence of the Government representative. The Contracting Officer may elect to accept certified weight certificates furnished by a public weigh master in lieu of scale weights at the jobsite.

(3) Unit of measure: ton.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02213

ENGINEERING FABRIC

-- End of Section Table of Contents --

SECTION 02213

ENGINEERING FABRIC

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 2487	(2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 4354	(1999) Sampling of Geosynthetics for Testing
ASTM D 4355	(1999) Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
ASTM D 4439	(2000) Geosynthetics
ASTM D 4491	(1999a) Water Permeability of Geotextiles by Permittivity
ASTM D 4533	(1991; R 1996) Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	(1991; R 1996) Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	(1999a) Determining Apparent Opening Size of a Geotextile
ASTM D 4759	(1988; R 1996) Determining the Specification Conformance of Geosynthetics
ASTM D 4833	(2000) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 4873	(1997) Identification, Storage, and Handling of Geosynthetic Rolls
ASTM D 4884	(1996) Strength of Sewn or Thermally Bonded Seams of Geotextiles

1.2 SUBMITTALS

Government approval is required for all submittals with a "G" designation; submittals not having a "G" designation are for information only. When

used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

~~SD-01 Preconstruction Submittals~~

~~Plan for Subaqueous Placement~~

~~The Contractor shall submit the Plan for Subaqueous Placement of engineering fabric for review not less than 30 days prior to start of placement.~~

SD-04 Samples

Fabric

Seams

Samples of engineering fabric shall be submitted for testing not less than 30 days prior to the beginning of installation of the engineering fabric. Actual field sewn seam samples shall be submitted for testing not less than 30 days prior to the beginning of installation of the engineering fabric. The sample average test results (weaker principle direction for mechanical tests) for a particular property for any individual roll tested within a lot shall meet or exceed the Minimum Average Roll Value (MARV) indicated in the manufacturer's certification.

SD-07 Certificates

Technical Representative

Installation

The Contractor shall submit the Technical Representative's resume of experience for review not less than 30 days prior to the start of placement.

Engineering Fabric

The Contractor shall submit in triplicate, a mill certificate or affidavit signed by a legally authorized official from the company manufacturing the engineering fabric. Certificates shall identify the engineering fabric being furnished by roll identification number. Certificates of compliance attesting that the materials meet specification requirements shall be submitted in accordance with Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph CERTIFICATES OF COMPLIANCE.

1.3 IDENTIFICATION, STORAGE, AND HANDLING

The geotextile shall be identified, stored, and handled in accordance with ASTM D 4873.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Fabric

The engineering fabric shall be a nonwoven geotextile, as defined by ASTM D 4439, consisting of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of ester, propylene, ethylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic if necessary to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The nonwoven engineering fabric shall conform to the physical property requirements tests in TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS, paragraph ACCEPTANCE REQUIREMENTS. The fabric rolls (strips) shall be manufactured in a minimum width of 12 feet.

2.1.2 Seams

The seams of the engineering fabric shall be sewn with thread of a material meeting the chemical requirements given above for the engineering fabric. Seams shall be tested in accordance with method ASTM D 4884. The strengths of the seam shall be not less than 80 percent of the required tensile strength (TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS) of the unaged fabric in any principal direction. Fabric and seams shall be aligned as specified in paragraph INSTALLATION OF ENGINEERING FABRIC.

2.1.3 Temporary Securing Pins

Temporary securing pins shall not be used.

2.1.4 Anchor Trench Backfill

Anchor trench backfill shall be filter material or other pervious material such as sands or gravels (SP, SW, GW, or GP) classified in accordance with ASTM D 2487.

2.2 ACCEPTANCE REQUIREMENTS

All brands of engineering fabric and all seams will be accepted on the following basis.

2.2.1 Testing

Government personnel may collect engineering fabric samples in accordance with ASTM D 4354 for testing to determine compliance with any or all of the requirements in this specification pursuant to ASTM D 4759 and the following table:

TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS
Minimum Average Roll Values (MARV)

PHYSICAL PROPERTY	GRADE 2	TEST PROCEDURE
Tensile Strength +(unaged fabric)	240 lbs Minimum	ASTM D 4632
Elongation	25% Minimum	ASTM D 4632
Puncture Strength +(unaged fabric)	115 lbs Minimum	ASTM D 4833

TABLE NO. 1 - PHYSICAL STRENGTH REQUIREMENTS
Minimum Average Roll Values (MARV)

PHYSICAL PROPERTY	GRADE 2	TEST PROCEDURE
Trapezoid Tear	90 lbs Minimum	ASTM D 4533
Permittivity	Greater than 0.7 per sec.	ASTM D 4491
Apparent Opening Size	Less than 70 sieve	ASTM D 4751
Ultraviolet Resistance	70% Minimum (percent of strength retained after 500 hours)	ASTM D 4355

+ Unaged fabric is defined as fabric in the condition received from the manufacturer or distributor.

2.2.2 Mill Certificates or Affidavits

The mill certificates or affidavits for engineering fabric shall attest that the fabric and factory seams meet chemical, physical, and manufacturing requirements stated in this specification. The mill certificates or affidavits shall specify the actual Minimum Average Roll Values (MARV) and shall identify the fabric supplied by manufacturer's name and roll identification numbers.

PART 3 EXECUTION

3.1 INSTALLATION OF ENGINEERING FABRIC

3.1.1 Installation: General

If site conditions exist on side slopes where the foundation on which the stone protection is to be placed is not clay, then the Contractor will be directed to install the engineering fabric based on evaluation of the foundation by the Construction Representative. The engineering fabric shall be placed in the manner and at the locations shown. At the time of installation, fabric shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage. The surface to receive engineering fabric shall be relatively smooth and free of obstructions, depressions, debris, and soft or low density pockets of material. The fabric shall be placed with the long dimension (machine direction) of the engineering fabric parallel to the centerline of the channel and shall be laid smooth and free of tension, stress, folds, wrinkles, or creases. The panels (sheets or strips) shall be placed to provide a minimum overlap width of 24 inches after placement of the riprap above water for each joint with the upstream panel overlapping the downstream panel and with the panels placed on channel slopes with the upper panel overlapping the next lower panel. Weights (Riprap) shall be used to temporarily hold the fabric in such a manner as to prevent the wind or other disturbance from lifting the fabric or shifting the overlap. The perimeter of the engineering fabric shall be anchored into the foundation with a trench or attached to the structure. The trench at the top of the slope shall not be backfilled until the filter material and riprap is in place on the fabric. Anchor trench backfill shall be used to anchor the engineering fabric in the trench. The fabric

shall be protected at all times during construction from contamination by surface runoff and fabric so contaminated shall be removed and replaced with uncontaminated fabric at no cost to the Government. Wheeled and/or tracked vehicles used in the placement of filter material or riprap are not allowed directly onto fabric and shall be of such design that they will not damage the underlying engineering fabric. Any fabric damaged during its installation or during placement of filter material or riprap shall be replaced by the Contractor at no cost to the Government. The work shall be scheduled so that the covering of the fabric with a layer of the specified material is accomplished within 10 days after placement of the fabric. Failure to comply shall require replacement of the engineering fabric at no additional cost to the Government. The engineering fabric shall be protected from damage due to the placement of riprap or other materials by limiting the height of drop of the material to 3 feet. Before placement of riprap, the Contractor shall demonstrate that the placement technique will prevent damage to the fabric.

~~3.1.2 Subaqueous Placement~~

~~3.1.2.1 Technical Representative~~

~~The Contractor shall engage the services of a technical representative of the engineering fabric manufacturer or a company experienced in subaqueous placement of engineering fabric. The representative shall design, or assist in designing, the procedures for the subaqueous engineering fabric placement and shall supervise the initial placement of the engineering fabric.~~

~~3.1.2.2 Plan for Subaqueous Placement~~

~~The Plan for Subaqueous Placement shall show complete placing procedures, equipment and sequencing and shall include, as a minimum, items prioritized and listed below:~~

~~a. Field required sewing of strips of engineering fabric.~~

~~b. Weights or other anti-flotation devices or procedures.~~

~~c. Securing of initial placement (tie-offs, tie-downs, etc.).~~

~~d. Horizontal control of placing equipment to assure required overlap or complete coverage of the foundation by engineering fabric.~~

~~e. Diver assistance if required, in placing and inspection of engineering fabric.~~

~~The panels of engineering fabric shall be placed with the long dimension (machine direction) parallel to the centerline of the channel. Any overlaps in the upstream-downstream direction shall have the upstream panel overlapping the downstream panel. Any overlaps on channel slopes shall have the upper panel overlapping the next lower panel. The fabric shall be placed starting from the downstream end and working upstream. The panels shall be placed to provide a minimum overlap of 3 feet. The work shall be scheduled so that the covering of the fabric, except for overlap, with a layer of the specified material is accomplished within 24 hours after placement of the fabric. Riprap may be dropped from the water surface if the water depth over the engineering fabric is greater than 5 feet. If water depth over the engineering fabric is less than 5 feet, the rock shall be dropped from the height not greater than that specified in paragraph~~

~~INSTALLATION: GENERAL. Any damage to the fabric during its installation, or during placement of filter material or riprap, shall be repaired by the Contractor at no additional cost to the Government.~~

-- End of Section --

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DIVISION 02 - SITE WORK

SECTION 02226

EXCAVATION, FILL AND BACKFILL

-- End of Section Table of Contents --

SECTION 02226

EXCAVATION, FILL AND BACKFILL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 698	(2000a) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))
ASTM D 1556	(2000) Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D 2167	(1994) Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D 2216	(1998) Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 2487	(2000) Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	(1996e1) Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1996e1) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Fill and Backfill Materials

2.1.1.1 General

All materials for fill and backfill shall be free of roots, trash and other objectionable matter and shall be obtained from the required excavation. Fill and backfill material shall consist of any or all types of materials that are free from unsuitable or frozen materials as defined in paragraph FROZEN MATERIALS and paragraph UNSUITABLE MATERIALS. Material classified in accordance with ASTM D 2487 as gravels (GW, GP, GM) and sands (SW, SP, SM) shall not be used as random material unless suitably blended with less pervious material. The addition of less pervious material and the blending shall be accomplished to such a degree that the material is changed to a

classification other than gravels (GW, GP, GM) and sands (SW, SP, SM) such as clayey-gravel (GC) or clayey-sand (SC).

2.1.1.2 Frozen Materials

No frozen material shall be placed and material shall not be placed against frozen surfaces.

2.1.1.3 Unsuitable Materials

Materials which are classified as unsuitable for fill or backfill material are defined as masses of organic matter, sticks, branches, roots and other debris. As earth may contain excessive amounts of wood, isolated pieces of wood will not be considered objectionable in the fill provided their length does not exceed 1 foot, their cross-sectional area is less than 4 square inches, and they are distributed throughout the fill. Not more than one percent (by volume) of objectionable material shall be contained in the earth material placed in each cubic yard of the fill or backfill section. Pockets and/or zones of wood shall not be placed in the fill or backfill.

PART 3 EXECUTION

3.1 EXCAVATION

3.1.1 General

Excavation shall consist of removal and disposal of all materials of whatever nature encountered, including riprap which may have been displaced, to excavate for the channel. Excavation may be performed by any approved methods which will produce the desired results.

3.1.2 Excavation for Channel

The channel shall be excavated to the lines, grades and sections indicated on the drawings, within allowable tolerance. Where disturbed by the Contractor's operations and elsewhere as required, the excavated surfaces shall be moistened with water or dried as necessary and tamped or rolled with suitable tools or equipment for the purpose of thoroughly compacting them and forming firm foundations upon or against which to place the stone. Except for the permissible tolerance, overexcavation will not be permitted except to remove unsuitable material as directed by the Contracting Officer. If at any point in the excavation, unauthorized excavation is made beyond the excavation lines shown on the drawings, such unauthorized overexcavation shall be backfilled with approved materials, placed in layers not more than 4 inches in thickness, and thoroughly compacted by tamping or rolling to a density at least equal to that of the adjacent similar undisturbed material, at no additional cost to the Government. Allowable tolerances shall be as specified in paragraph GRADE TOLERANCES.

3.1.3 Removal of Unsuitable Materials

If, at any point in the excavation for the channel, the foundation material below the lines indicated on the drawings is found to be unsuitable, it shall be removed to the depth directed by the Contracting Officer and replaced with approved material placed and compacted as specified above for backfill of overexcavation. Payment for authorized overexcavation and backfill of authorized overexcavation will be made in accordance with the Contract Clause CHANGES. No payment will be made for unauthorized overexcavation or backfill of unauthorized overexcavation.

3.1.4 Disposal of Excavated Materials

Suitable materials removed from required excavation may be disposed of by placing directly into the required fill or backfill, or by stockpiling for later use in fill or backfill. Materials from channel excavation which are not suitable for use as fill or backfill, or in excess of that required for fill or backfill, shall be disposed of by placing it in a Contractor furnished upland disposal area(s) outside the Government-furnished rights-of-way. The location and dimensions of the Contractor-furnished disposal area(s) shall be approved prior to disposal of any material. Disposal area shall not be located in any river, stream, lake or wetland area. Disapproval by the Contracting Officer of Contractor-furnished disposal areas shall not form the basis of a claim against the Government. The Contractor shall obtain the rights-of-way for the disposal area(s) in accordance with Section 01000 GENERAL CONTRACT REQUIREMENTS, paragraph RIGHTS-OF-WAY. No separate payment will be made for Contractor-furnished disposal area(s).

3.1.4.1 Disposal of Discarded Materials

Discarded material other than those which can be included in the solid waste category shall be disposed of as specified in paragraph EXCAVATION, subparagraph DISPOSAL OF EXCAVATED MATERIALS.

3.2 STOCKPILING OF MATERIALS

Stockpiles of materials temporarily stored for later use shall be located in areas approved by the Contracting Officer. Stockpiles shall be built up in layers not more than 24 inches in thickness. Stockpiled material shall have a maximum height not to exceed 10 feet, shall have end and/or side slopes not steeper than 1V on 2H, and the surfaces of all stockpiles shall be sloped to drain readily and sealed by compacting. Excavation from stockpiles shall be made so as to maintain drainage at all times. No stockpiled material shall be placed within 20 feet of top bank of inlet or outlet ditches as finally excavated. No material shall be stockpiled within 20 feet of top bank of structure excavation.

3.3 PLACEMENT

3.3.1 Foundation Preparation

All unsuitable foundation material consisting of soft, wet, or organic material or debris within the area upon which fill or backfill is to be placed shall be removed to the depth directed before any fill or backfill materials are placed. Unsuitable material shall be disposed of off-site in a Contractor furnished disposal area. The top 6 inches of the ground surface (after stripping) shall be disced and then compacted to the same requirements as overlying fill. Sloped ground surfaces steeper than 1V on 4H on which fill or backfill is to be placed shall be plowed, stepped or benched, or broken up as directed, in such manner that the new material will bond with the existing surface. Prepared surfaces on which fill or backfill is to be placed shall be wetted or dried as may be required to obtain the required compaction.

3.3.2 Fill and Backfill

3.3.2.1 General

a. All fills and backfills associated with the channel shall be placed as semicompacted fill. Unless otherwise directed, the backfill or fill shall be brought up and maintained at approximately the same level regardless of the number of types of material being placed. Materials shall be so placed that there is no mixing of the different types of materials in the backfill or fill.

~~b. Where material must be placed in the water, it shall be dumped therein until it reaches an elevation one foot above the water surface, or until a stable fill surface is obtained before layer construction may begin. The material deposited under water shall be placed in such a manner to ensure that any soft material will be forced progressively outward from the section and not be trapped within the base of the embankment.~~

3.3.2.2 Spreading

After dumping, the materials shall be spread by bulldozer or other approved means in approximately horizontal layers over the entire area under construction. During the dumping and spreading process, the Contractor shall remove all roots, trash and debris from the backfill materials. Random materials shall be placed in layers not more than 6 inches in thickness prior to compaction with tamping rollers. As soon as practicable after commencement of construction of any section of the backfill or fill, the surface shall be sloped to drain freely and shall be so maintained throughout construction. If the compacted surface of any layer of random material is determined to be too smooth to bond properly with the succeeding layers, it shall be loosened by harrowing or by other approved means before the succeeding layer is placed thereon. Ruts in the surface of any layer shall be removed by scarifying before placing and compacting additional materials.

3.4 COMPACTION

3.4.1 Semicompacted Fill and Backfill

3.4.1.1 Random Materials

After a layer of random backfill/fill material has been dumped and spread, it shall be harrowed or disced, if required, to break up and blend the backfill materials, unless harrowing or discing is performed to obtain uniform moisture distribution. Harrowing or discing shall be performed with a spring-tooth harrow or other approved harrow or disc to the depth of the uncompacted layer. If one pass of the harrow or disc does not accomplish the breaking up and blending of the materials, additional passes of the harrow or disc may be required, but in no case will more than three passes of the harrow or disc on any one layer be required for this purpose. When the moisture content and the condition of the layer is satisfactory, the lift shall be compacted to at least 90 percent of the maximum density. The maximum dry density shall be determined by the Contractor from representative samples of each type of material in accordance with ASTM D 698. Test results shall be furnished to the Contracting Officer prior to placing material. Portions of the backfill or fill which are not accessible to the roller shall be placed in 4 inch layers and compacted with power tampers to a degree at least equal to that obtained on the other portions of the compacted backfill or fill by rolling as specified. Dumping, spreading, sprinkling, and compacting may be performed at the same time as different points along a section when there is sufficient area to permit these operations to proceed simultaneously.

3.5 MOISTURE CONTROL

3.5.1 General

The materials in each layer of the fill and backfill shall contain the quantity of moisture within the limits specified below or as directed which is necessary to obtain the desired compaction as determined by the Contracting Officer.

3.5.2 Random Materials

The moisture content shall be as uniform as practicable throughout any one layer of random materials. The upper and lower limits of moisture content shall not be more than 3 nor less than 2 percentage points, respectively, from the optimum moisture content. The Contractor shall determine optimum moisture content from representative samples of each type of material in accordance with ASTM D 698. Test results shall be furnished to the Contracting Officer prior to placing material. The method of determining the optimum moisture content shall be according to ASTM D 2216. Material that is too wet shall be spread on the backfill and permitted to dry, assisted by discing or harrowing, if necessary, until the moisture content is reduced to a value within the specified limits. When the material is too dry, the Contractor will be required to sprinkle each layer on the backfill. Harrowing or other approved methods will be required to work the moisture into the material until a uniform distribution of moisture is obtained. Water applied on a layer of backfill shall be accurately controlled in quantity so that free water will not appear on the surface during or subsequent to rolling. Should too much water be added to any part of the backfill so that the material is too wet to obtain the desired compaction, the rolling and all work on that section of the backfill shall be delayed until the moisture content of the material is reduced to a value within the specified limits and such delay shall not be the basis for a claim. If, in the opinion of the Contracting Officer, the top or contact surfaces of a partial backfill section becomes too dry or too wet to permit suitable bond between these surfaces and the additional backfill to be placed thereon, the Contractor shall loosen the dried or wet materials by scarifying or discing to such depths as may be directed by the Contracting Officer, shall dampen or dry the loosened material to an acceptable moisture content and shall compact this layer as provided in paragraph COMPACTION, to densities comparable to the underlying backfill or fill, at no additional cost to the Government.

3.6 SLIDES

3.6.1 Embankment Slides

In the event of the sliding of any part of the embankment during construction or after completion, but prior to acceptance, the Contractor shall, upon written order of the Contracting Officer, cut out and remove the slide and then rebuild that portion of the embankment or as an alternative shall construct a stability berm of such dimensions and placed in such manner as the Contracting Officer shall prescribe. In case the slide is caused through fault or negligence of the Contractor, the foregoing operations shall be performed without cost to the Government. In case the slide in the embankment is not caused through fault or negligence of the Contractor, the volume ordered removed from the embankment and yardage replaced in the embankment and fill volume for stability berms will be paid for in accordance with the Contract Clause CHANGES, in addition to

any payment due the Contractor for materials previously placed. In either case, the method of slide correction will be determined by the Contracting Officer

3.6.2 Channel Slides

In case sliding occurs in any part of the prescribed excavation for the channel during construction or after completion but prior to acceptance, the Contractor shall remove and repair such portions of the slides as the Contracting Officer may direct. In case the slide is caused through fault or negligence of the Contractor, the slide shall be removed and repaired without cost to the Government. In case the slide is not caused through fault or negligence of the Contractor, an equitable adjustment pursuant to the Contract Clause CHANGES will be made for removing and repairing the slide.

3.7 GRADE TOLERANCES

3.7.1 General

Excavations, fills and backfills shall be constructed to the lines and grades and sections indicated on the contract drawings. The following tolerances will be permitted above and below the design grades and cross sections provided that the areas drain and there are no abrupt bulges or depressions in surfaces and side slopes are uniform. Neither extreme of such tolerances may be continuous over an area greater than 200 square feet and abrupt changes from one extreme to the other will not be permitted.

3.7.2 Channels

For the bottom elevation and side slopes of the channels, a vertical tolerance of plus or minus 6 inches will be permitted. Bottom and side slopes shall present a neat, smooth surface, and shall be free from all obstructions.

3.7.3 Stone Protection Areas

For areas to receive stone protection, a tolerance of plus 2 inches and minus 4 inches will be permitted.

3.8 FIELD TESTING CONTROL

Testing shall be the responsibility of the Contractor and shall be performed by an approved commercial testing laboratory or by the Contractor subject to approval. Field density and moisture content tests shall be performed on every 250 cubic yards of material placed. Field in-place density shall be determined in accordance with ASTM D 1556, ASTM D 2167, or ASTM D 2922. Moisture content tests shall be in accordance with ASTM D 3017. The calibration checks of both the density and moisture gages shall be made at the beginning of a job on each different type of material encountered and at intervals as directed. The Contractor shall submit all results of control tests and reports as well as records of correction action taken in accordance with Section 01451 CONTRACTOR QUALITY CONTROL.

-- End of Section --

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DIVISION 02 - SITE WORK

SECTION 02380

STONE PROTECTION FOR STRUCTURES

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SECTION 02380

STONE PROTECTION FOR STRUCTURES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 127	(1988; R 1993e1) Specific Gravity and Absorption of Coarse Aggregate
ASTM C 295	(1998) Petrographic Examination of Aggregates for Concrete

CORPS OF ENGINEERS (COE)

COE CRD-C 144	(1992) Testing Stone for Resistance to Freezing and Thawing
COE CRD-C 169	(1997) Resistance of Rock to Wetting and Drying

1.2 GOVERNMENT TESTING AND STUDIES

1.2.1 Stone

1.2.1.1 General

All stone shall be durable material as approved by the Contracting Officer. In case an unlisted source is to be used, the Contractor shall show that an adequate quantity of material is available and provide quality test data. Stone shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, seams and other defects that would tend unduly to increase its deterioration from natural causes. The stone shall be clean and reasonably free from earth and dust and shall contain no refuse.

1.2.1.2 Sources

Stone shall be furnished from any of the sources listed at the end of this section, or at the option of the Contractor may be furnished from any other source designated by the Contractor and accepted by the Contracting Officer, subject to the conditions herein stated. If the Contractor proposes to furnish stone from a source not currently listed at the end of this section, the Government will conduct a quarry investigation and evaluate the quality test data provided by the contractor to determine whether acceptable stone can be produced from the proposed source. Satisfactory service records on other work may be acceptable. In order for stone to be acceptable on the basis of service records, stone of a similar size must have been placed in a similar thickness and exposed to weathering under similar conditions as are anticipated for this contract, and must

have satisfactorily withstood such weathering for a minimum of 20 years.

a. List of Sources. On the basis of information and data available to the Contracting Officer, stone meeting the quality requirements of these specifications has been produced from the sources listed at the end of this section.

b. Selection of Source. The Contractor shall designate in writing only one source or one combination of sources from which he proposes to furnish stone. If the Contractor proposes to furnish stone from a source not listed at the end of this section, he may designate only a single unlisted source for stone and he shall notify the Contracting Officer at least 60 workdays before the stone leaves the quarry. It is the Contractor's responsibility to determine that the stone source or combination of sources selected is capable of supplying the quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work. Samples for acceptance testing shall be provided in accordance with paragraph EVALUATION TESTING. If a source for stone so designated by the Contractor is not accepted for use by the Contracting Officer, the Contractor may not propose other sources but shall furnish the stone from a source listed at the end of this section at no additional cost to the government.

c. Acceptance of Materials. Acceptance of a source of stone is not to be construed as acceptance of all material from that source. The right is reserved to reject materials from certain localized areas, zones, strata, or channels, when such materials are unsuitable for stone as determined by the Contracting Officer. Materials produced from a listed or unlisted source shall meet all the requirements herein.

1.3 SUBMITTALS

Government approval is required for all submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-06 Test Reports

Gradation Test

The gradation tests shall be submitted using the GRADATION TEST DATA SHEET enclosed at end of this section.

Evaluation Tests

Quality tests on the stone in accordance with paragraph EVALUATION TESTING shall be the responsibility of the Contractor and submitted for approval prior to delivery of such material to the worksite.

Filter Material

Test reports shall be submitted attesting that the filter material meets the requirements specified.

SD-07 Certificates

Filter Material

Riprap

Laboratory

Certificates of compliance attesting that the materials meet specification requirements shall be submitted to the Contracting Officer.

A copy of the testing laboratory's certification and inspection report shall be submitted along with actions taken to correct deficiencies.

PART 2 PRODUCTS

2.1 FILTER MATERIAL

Filter material shall consist of filter stone and engineering fabric. The filter stone shall be composed of tough, durable particles, reasonably free from thin, flat and elongated pieces, and shall contain no organic matter nor soft, friable particles in quantities considered objectionable by the Contracting Officer. Grading shall conform to the following requirements:

U.S. STANDARD SIEVE	PERMISSIBLE LIMITS PERCENT BY WEIGHT, PASSING
FILTER STONE	
6 inch	100
4 inch	45-100
3 inch	29-100
1-1/2 inch	8-48
1 inch	0-20
1/2 inch	0-5

The filter stone shall be well-graded between the limits shown. At least one test shall be performed on each 1,000 tons to be delivered to the project site for each specified gradation. All points on individual grading curves obtained from representative samples of filter stone shall lie between the boundary limits as defined by smooth curves drawn through the tabulated gradation limits plotted on ENG FORM 2087 or similar form. The individual gradation curves within these limits shall not exhibit abrupt changes in slope denoting either skip grading or scalping of certain sizes or other irregularities which would be detrimental to the proper functioning of the filter. Engineering fabric shall be as specified in Section 02213 ENGINEERING FABRIC.

2.2 RIPRAP

2.2.1 General

Only quarried stone shall be used. Riprap quality shall be as specified in paragraph GOVERNMENT TESTING AND STUDIES, subparagraph STONE. Gradation shall conform to the table(s) below and to the plate(s) attached at the end of this section. A maximum of 10 percent flat and elongated pieces will be acceptable. A flat and elongated piece of riprap is defined as a stone with either the width or thickness of the piece being less than one-third of the length.

TABLE I
(FOR RIPRAP "R200")

PERCENT LIGHTER BY WEIGHT (SSD)	LIMITS OF STONE WEIGHT, LB.
100	200 - 80
50	80 - 40
15	40 - 10

TABLE II
(FOR RIPRAP "R650")

PERCENT LIGHTER BY WEIGHT (SSD)	LIMITS OF STONE WEIGHT, LB.
100	650 - 260
50	280 - 130
15	130 - 40

2.2.2 Evaluation Testing

If the Contractor proposes to furnish stone from an unlisted source, the Contractor shall have evaluation tests performed on stone samples collected from the proposed source. The tests to which the stone shall be subjected include petrographic examination (ASTM C 295), specific gravity, unit weight, and absorption (ASTM C 127), resistance of stone to freezing and thawing (COE CRD-C 144), and if sandstone is used, resistance to wetting and drying in accordance with (COE CRD-C 169).

a. Unit Weight and/or Absorption. Stone shall weigh more than 155 lbs/cubic foot. The stone shall have an absorption less than 2 percent unless other tests and service records show that the stone is satisfactory. The method of test for unit weight and absorption will be ASTM C 127, except the unit weight will be calculated in accordance with Note No. 5 using bulk specific gravity, saturated surface dry.

b. Resistance to Freezing and Thawing. Stone when tested in accordance with COE CRD-C 144 shall have a loss of less than 5 percent.

c. Resistance to Wetting and Drying. This test shall only be required to be performed on sandstone samples. When tested in accordance with COE CRD-C 169 (35 cycles), there shall be a loss of less than one percent.

d. Samples. Samples of stone from a source not listed at the end of this section shall be taken by a representative of the Quarry under the supervision of the Contracting Officer for testing and acceptance prior to delivery of any stone from this source to the site of the work. Samples shall consist of at least three pieces of stone, roughly cubical in shape and weighing not less than 75 pounds each. The samples shall be shipped at the Contractor's expense to a laboratory certified by the government to perform the required tests.

e. Tests. The tests shall be conducted by the Contractor in accordance with applicable Corps of Engineers methods of tests given in the Handbook for Concrete and Cement, and shall be performed at a laboratory certified by the government. The cost of testing shall be

borne by the Contractor.

2.2.3 Gradation Test

The Contractor shall perform a gradation test or tests on the riprap at the quarry in accordance with paragraph STANDARD TEST METHOD FOR GRADATION OF RIPRAP AND GRADED STONE. The sample shall be taken by the Contractor in the presence of the Contracting Officer. The Contractor shall notify the Contracting Officer not less than 3 days in advance of each test. In the event of unavailability of a Government representative; the Contractor shall perform the tests and certify to the Contracting Officer that the riprap shipped complies with the specifications. At least one gradation test shall be performed per 50,000 tons of each size of riprap placed, but not less than one test shall be performed. The gradation tests shall be reported using the forms, GRADATION TEST DATA SHEET and ENG FORM 4794-R, attached at end of this section. The Contractor shall designate on the test form that portion in tons of the lot tested which is applicable to this contract. Any deviation from the reported tonnage shall be corrected and recorded on a revised GRADATION TEST DATA SHEET. The sample shall consist of not less than 25 tons of R200 riprap and at least 50 tons of R650 riprap, and shall be collected in a random manner which will provide a sample which accurately reflects the actual gradation arriving at the jobsite. Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarry process, and all riprap represented by the failed tests shall be set aside and not incorporated into the work. Any additional tests required because of the failure of an initial test sample will not be considered as one of the other required tests. If collected by the truckload, each truckload shall be representative of the gradation requirements. The Contracting Officer may direct additional testing of the riprap at the project site if the riprap appears by visual inspection, to be out of gradation. The Contracting Officer may direct this testing under the Contract Clause INSPECTION OF CONSTRUCTION. The Contractor shall provide all necessary screens, scales and other equipment, the operating personnel, and shall grade the sample. Certification and test results shall represent riprap shipped from the quarry. Certification and tests results must be received by the Contracting Officer at the jobsite before the riprap is used in the work.

2.2.4 Riprap Stockpile

Temporary storage of riprap at the worksite is not to be confused with off-site stockpiling of riprap. No off-site stockpiling areas will be allowed.

2.2.5 Worksite Stockpile

Riprap delivered to the work sites, which requires temporary storage landward of top bank, shall be placed in a container suitable for storing the riprap without waste, or a sand-clay-gravel or crushed stone pad may be constructed for the storage area and removed upon completion of the work. If the sand-clay-gravel or crushed stone pad method is used, the pad shall have a minimum thickness of at least 6 inches. The container or sand-clay-gravel or crushed stone pad method shall be subject to approval prior to delivery of the riprap. Upon completion of the work, the storage areas shall be cleaned of all storage residues and returned to their natural condition. Temporary storage of riprap at the worksite will be allowed, provided the stream-side toe of the riprap be no closer than 60 linear feet from the closest edge of the stream's top bank, and the amount

shall not exceed 200 tons unless otherwise approved. The Contractor's jobsite stockpile shall be a maximum of 12 feethigh and formed by a series of layers of truckload dumps, where the rock essentially remains where it is placed. Subsequent layers shall be started 10 feet from the edge of the previous layer so that the rock will not roll down the edges of the previous layers. The first layer shall be a maximum of 6 feet high. Any riprap which has become contaminated with soil, dirt, or refuse after being stockpiled, will not be put into the work unless the contaminating material has been removed from the riprap prior to placement.

2.2.6 Off-site Stockpile

The Contractor's off-site riprap stockpile shall be a maximum of 12 feet high and formed by a series of layers of truckload dumps, where the rock essentially remains where it is placed. Subsequent layers shall be started 10 feet from the edge of the previous layer so that the rock will not roll down the edges of the previous layers. The first layer shall be a maximum of 6 feet high. Any riprap which has become contaminated with soil, dirt, or refuse after being stockpiled, will not be put into the work unless the contaminating material has been removed from the riprap prior to placement. In areas where riprap is stockpiled for placement, the area shall have excess rock removed prior to completion of work. All rock and spalls greater than 3 inches in diameter shall be removed. Where rocks may have become buried due to soft ground or operation of the equipment, the rock shall be disposed of as directed. After the rock has been removed, the storage area shall be graded, dressed, and filled to return the ground surface as near as practical to the condition that existed prior to construction.

PART 3 EXECUTION

3.1 BASE PREPARATION

3.1.1 **Areas Within Existing Grouted Riprap Areas**

In areas where riprap is to be placed over existing grouted riprap, the base shall be prepared by breaking all of existing grouted riprap into minimum 36-inch diameter pieces and ensure that underlying voids are sufficiently filled with broken material.

3.1.2 **All Other Areas To Receive Stone**

Areas on which filter layers and riprap are to be placed shall be graded and/or dressed to conform to cross sections shown on the contract drawings within an allowable tolerance of plus 2 inches and minus 4 inches from the theoretical slope lines and grades. The prepared base shall be approved by the Contracting Officer. Where such areas are below the allowable minus tolerance limit they shall be brought to grade by fill with earth similar to the adjacent material and then compacted to a density equal to the adjacent in place material. Subaqueous areas, on which ~~filter materials and~~ riprap ~~are~~**is** to be placed, shall be graded and/or dressed to conform to cross sections shown on the contract drawings within an allowable tolerance of plus 1 foot and minus 2 feet from the specified lines and grades. Where such areas are below the allowable minus tolerance limit they shall be filled with ~~filter stone~~**riprap**. No additional payment will be made for any material thus required. Immediately prior to placing the filter layers, the prepared base will be inspected by the Contracting Officer and no material shall be placed thereon until that area has been approved.

3.2 PLACEMENT OF FILTER LAYERS

3.2.1 General

Filter layers, composed of engineering fabric **(if required)** and a layer of filter stone shall be placed on the prepared base as described below, in accordance with the details shown on the contract drawings, and within the limits either shown on the contract drawings or staked in the field, to form a backing for the stone protection.

3.2.2 Engineering Fabric

Installation of engineering fabric shall be as specified in Section 02213 ENGINEERING FABRIC. Crushed stone shall be spread uniformly on the engineering fabric to the lines and grades as indicated on the contract drawings and in such manner as to avoid damage to the engineering fabric. Placing of crushed stone by methods which tend to segregate the particle sizes within the filter layer will not be permitted. Any damage to the surface of the engineering fabric during placement of crushed stone shall be repaired before proceeding with the work. Compaction of material placed on the engineering fabric will not be required, but shall be finished to present a reasonably even surface, free from mounds or windrows.

3.3 PLACEMENT OF RIPRAP

3.3.1 General

Riprap shall be placed on **existing riprap or on** the filter layers specified in paragraph FILTER MATERIAL within the limits shown on the drawings.

3.3.2 Placement

Under water placement rates shall be used when the top of the layer to be placed is covered by more than 3 feet of water.

3.3.2.1 Above Water

Riprap shall be placed in such manner as to produce a reasonably well graded mass of rock with the minimum practicable percentage of voids, and shall be constructed within the specified tolerance to the lines and grades shown on the drawings. A tolerance of plus 4 inches or minus 4 inches from the slope lines and grades shown on the drawings will be allowed in the finished surface of the riprap, except that either extreme of such tolerance shall not be continuous over an area greater than 200 square feet. The average tolerance of the entire job shall have no more than 50 percent of the tolerance specified above. No stone shall be dropped through air from a height greater than 3 feet and stones heavier than 500 pounds shall not be dropped from a height greater than 2 feet. The larger stones shall be well distributed and the entire mass of stones in their final position shall be roughly graded to conform to the gradation specified in paragraph RIPRAP, subparagraph GENERAL. The finished riprap shall be free from objectionable pockets of small stones and clusters of larger stones. Placing riprap in layers will not be permitted. Placing riprap by dumping into chutes or by similar methods likely to cause segregation of the various sizes will not be permitted. Placing riprap by dumping it at the top of the slope and pushing it down the slope will not be permitted. No equipment shall be operated directly on the completed stone protection system. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the

quarry or other source; by controlled dumping of successive loads during final placing, or by other methods of placement which will produce the specified results. All dump trucks used in placing the riprap shall be equipped with bottom hinged tailgates. The gate releasing mechanism shall be arranged so that it may be operated only from, at, or near the front of the truck. Rearranging of individual stones will be required to the extent necessary to obtain a reasonably well-graded distribution of stone sizes as specified above. The Contractor shall maintain the stone protection until accepted by the Contracting Officer and any material displaced by any cause shall be replaced at his expense to the lines and grades shown on the drawings.

3.3.2.2 Under Water

When riprap is placed under water it may be dropped from the water surface~~—if the water depth over the engineering fabric is greater than 5 feet~~. Riprap placed in the wet shall be placed evenly at a rate of 16 tons per square per pass for R200 riprap and 25 tons per square (100 sq ft) per pass for R650 riprap. Prior to starting work, the Contractor shall submit his proposed method of placing riprap under water. Riprap to be placed in the wet shall be done during periods of low water levels during the months of June through November. The riprap shall be placed in two passes, with the second pass perpendicular to the first pass. The total quantity of R200 riprap placed in two passes shall be 8 tons per square and the total quantity of R650 riprap placed in two passes shall be 12.5 tons per square.

3.4 TESTS

3.4.1 General

The Contractor shall perform gradation tests to assure compliance with contract requirements and shall maintain detailed records.

3.4.2 Reporting

Reporting shall be in accordance with paragraph GRADATION TEST.

3.4.3 Standard Test Method for Gradation of Riprap and Graded Stone

a. Select a representative sample (Note No. 1), weigh and dump on hard stand.

b. Select specific sizes (see example) on which to run "individual weight larger than" test. (See Note No. 2). Procedure is similar to the standard aggregate gradation test for "individual weight retained".

c. Determine the largest size stone in the sample. (100 percent size)

d. Separate by "size larger than" the selected weights, starting with the larger sizes. Use reference stones, with identified weights, for visual comparison in separating the obviously "larger than" stones. Stones that appear close to the specific weight must be individually weighed to determine size grouping. Weigh each size group, either individually or cumulatively.

e. Paragraph d above will result in "individual weight retained" figures. Calculate individual percent retained (heavier than) cumulative percent retained and cumulative percent passing (lighter than). Plot percent passing, along with the specification curve on ENG

Form 4794-R.

NOTE NO. 1: Sample Selection: The most important part of the test and the least precise is the selection of a representative sample. No "standard" can be devised; larger quarry run stone is best sampled at the shot or stockpile by given direction to the loader; small graded stone is best sampled by random selection from the transporting vehicles. If possible, all parties should take part in the sample selection, and agree before the sample is run, that the sample is representative.

NOTE NO. 2: Selection of Size for Separation: It is quite possible and accurate to run a gradation using any convenient sizes for the separation, without reference to the specifications. After the test is plotted on a curve, then the gradation limits may be plotted. Overlapping gradations with this method are no problem. It is usually more convenient, however, to select points from the gradation limits, such as the minimum 50 percent size, the minimum 15 percent size, and one or two others, as separation points.

F O R

E X A M P L E

O N L Y

EXAMPLE GRADATION
SPECIFICATIONS

STONE WEIGHT IN LBS.	PERCENT LIGHTER BY WEIGHT
400-160	100
160-80	50
80-30	15

EXAMPLE WORKSHEET

STONE SIZE LBS.	INDIVIDUAL WT. RETAINED	INDIVIDUAL PERCENT RETAINED	CUMULATIVE RETAINED	PERCENT PASSING
400	0	0	0	100
160	9,600	30	30	70
80	11,200	35	65	35
30	8,000	25	90	10
-30	3,200	10	100	-
TOTAL	32,000 lbs.			

NOTE: Largest stone 251 lbs.

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DIVISION 02 - SITE WORK

SECTION 02775

CONTROL OF WATER

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SECTION 02775

CONTROL OF WATER

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

The work covered by this section of the contract specifications consists of furnishing all plant, labor, materials, equipment, and collecting and disposing of water regardless of its source ~~(including subsurface)~~ within the work areas. ~~No separate measurement or payment will be made for control of water, and all costs therefor shall be included in the applicable contract prices contained in the Bidding Schedule~~.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CONTROL OF WATER

3.1.1 Stream Description

During periods of rainfall the stream is subject to a fast rise and fall.

3.1.2 Contract Requirements

The Contractor shall take such action as necessary to control water in and through the work site. Diversion of the stream outside its banks will not be permitted. The work shall be constructed on a firm foundation in areas free of surface water.

-- End of Section --